

## CLAIMS

What is claimed is:

1           1.       A microelectronic device, comprising:  
2           a microelectronic die having an active surface, a back surface, and at least one  
3 side;  
4           said at least one microelectronic die side comprising at least one beveled sidewall  
5 and at least one channel sidewall, wherein said at least one beveled sidewall extends  
6 between said channel sidewall and said microelectronic die back surface; and  
7           a metallization layer disposed on said microelectronic die back surface and said at  
8 least one beveled sidewall.

1           2.       The microelectronic device of claim 1, wherein said at least one beveled  
2 sidewall is between about 30 degrees and about 60 degrees from said at least one channel  
3 sidewall.

1           3.       The microelectronic device of claim 2, wherein said at least one beveled  
2 sidewall is about 45 degrees from said at least one channel sidewall.

1           4.       The microelectronic device of claim 1, wherein said metallization layer is  
2 at least one metal selected from the group consisting of gold, silver, chromium, titanium,  
3 nickel vanadium, and nickel.

1 5. A microelectronic device assembly, comprising:  
2 a microelectronic die having an active surface, a back surface, and at least one  
3 side;  
4 said at least one microelectronic die side comprising at least one beveled sidewall  
5 and at least one channel sidewall, wherein said at least one beveled sidewall extends  
6 between said channel sidewall and said microelectronic die back surface;  
7 a metallization layer disposed on said microelectronic die back surface and said at  
8 least one beveled sidewall; and  
9 a heat dissipation device attached to said microelectronic die back surface with a  
10 thermal interface material.

1 6. The microelectronic device of claim 5, wherein said at least one beveled  
2 sidewall is between about 30 degrees and about 60 degrees from said at least one channel  
3 sidewall.

1 7. The microelectronic device of claim 6, wherein said at least one beveled  
2 sidewall is about 45 degrees from said at least one channel sidewall.

1 8. The microelectronic device assembly of claim 5, wherein said  
2 metallization layer is at least one metal selected from the group consisting of gold, silver,  
3 chromium, titanium, tungsten, vanadium, and nickel.

1           9.     The microelectronic device assembly of claim 5, wherein said thermal  
2 interface material is selected from the group consisting of lead, tin, indium, silver,  
3 copper, and alloys thereof.

1           10.    The microelectronic device assembly of claim 5, wherein at least a portion  
2 of a fillet of said thermal interface material extend from said metallization layer on said  
3 microelectronic die beveled sidewall to said heat dissipation device.

1           11.    A method of dicing a microelectronic device wafer, comprising:  
2           providing a microelectronic device wafer comprising a semiconductor wafer  
3 having a back surface, said microelectronic device including at least two integrated  
4 circuit areas formed therein separated by at least one scribe street;  
5           forming at least one substantially V-shaped notch opposing said at least one scribe  
6 street and extending from said semiconductor wafer back surface into said semiconductor  
7 wafer, wherein said substantially v-shaped notch comprises at least two sidewalls that  
8 terminate at an intersection location;  
9           forming a metallization layer on said semiconductor wafer back surface and said  
10 at least two notch sidewalls; and  
11           forming a channel within said at least one scribe street and extending through said  
12 interconnection layer, said semiconductor wafer, and said intersection location.

1           12.    The method of claim 11, wherein providing said microelectronic further  
2 includes providing said microelectronic device wafer having an interconnection layer  
3 disposed on said active surface.

1           13.    The method of claim 11, wherein forming said substantially v-shaped  
2 notch comprises forming said substantially v-shaped notch by a method selected from the  
3 group consisting of laser ablation, etching, and cutting with a wafer saw.

1           14.    The method of claim 11, wherein forming said metallization layer on said  
2 semiconductor wafer back surface and said at least two notch sidewalls comprises  
3 depositing at least one layer of metal selected from the group consisting of gold, silver,  
4 chromium, titanium, tungsten, vanadium, and nickel.

1           15.    A method of fabricating a microelectronic device assembly, comprising:  
2           providing a microelectronic die having an active surface, a back surface, and at  
3 least one side, wherein said at least one microelectronic die side comprises at least one  
4 beveled sidewall and at least one channel sidewall;  
5           disposing a metallization layer on said microelectronic die back surface and said  
6 at least one beveled sidewall; and  
7           attaching a heat dissipation device to said microelectronic die back surface with a  
8 thermal interface material.

1           16.    The method of claim 15, wherein disposing said metallization layer  
2   comprises disposing at least one metal selected from the group consisting of gold, silver,  
3   chromium, titanium, tungsten, vanadium, and nickel on said microelectronic die back  
4   surface and said at least one beveled sidewall.

1           17.    The method of claim 15, wherein attaching said heat dissipation device  
2   comprises attaching said heat dissipation device with a thermal interface material selected  
3   from the group consisting of lead, tin, indium, silver, copper, and alloys thereof.

1           18.    The method of claim 15, wherein attaching said heat dissipation device  
2   comprises attaching said heat dissipation device with said thermal interface material such  
3   that a portion of a fillet of said thermal interface material extends from said metallization  
4   layer on said at least one beveled sidewall to said heat dissipation device.

1           19.    The method of claim 15, wherein providing said microelectronic die  
2   comprises:  
3        providing a microelectronic device wafer comprising a semiconductor wafer  
4   having a back surface, said microelectronic device including at least two integrated  
5   circuit areas formed therein separated by at least one scribe street;  
6        forming at least one substantially V-shaped notch opposing said at least one scribe  
7   street and extending from said semiconductor wafer back surface into said semiconductor

8 wafer, wherein said substantially v-shaped notch comprises at least two sidewalls that  
9 terminate at an intersection location;  
10 forming a metallization layer on said semiconductor wafer back surface and said  
11 at least two notch sidewalls; and  
12 forming a channel within said at least one scribe street and extending through said  
13 interconnection layer, said semiconductor wafer, and said intersection location.

1 20. The method of claim 19, wherein providing said microelectronic die  
2 further includes providing said microelectronic device wafer having an interconnection  
3 layer disposed on said active surface.

1 21. The method of claim 19, wherein forming said substantially v-shaped  
2 notch comprises forming said substantially v-shaped notch by a method selected from the  
3 group consisting of laser ablation, etching, and cutting with a wafer saw.

1 22. The method of claim 19, wherein forming said metallization layer on said  
2 semiconductor wafer back surface comprises depositing at least one layer of metal  
3 selected from the group consisting of gold, silver, chromium, titanium, tungsten,  
4 vanadium, and nickel.